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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,251	10/16/2001	Myung Sub Sim	K-0317	2253

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EXAMINER

HO, THOMAS M

ART UNIT	PAPER NUMBER
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2134

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/977,251

Applicant(s)

SIM, MYUNG SUB

Examiner

Thomas M. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-9 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9, 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-4, 6-9, 11-14 are pending.

Response to Arguments and Amendments

2. The rejections of the claims under 35 USC 102 anticipated by the admitted prior art have been withdrawn.

The rejection under 35 USC 112 has been withdrawn.

The Applicant has argued the following:

(page 7, paragraphs 2-3)

Van Stralen and AAPA do not teach or suggest all the features of the independent claim 1. The Office Action states (with respect to previous dependent claim 5) that Van Stralen's Fig. 1 discloses the interleaving operation, the secondarily decoding, and the deinterleaving operation being implemented simultaneously. The Office Action does not cite any section of Van Stralen's written disclosure. However, these three operations in Van Stralen can only be performed sequentially. There is no suggestion in Van Stralen that interleaving, secondarily decoding and

deinterleaving are implemented simultaneously. Thus, Van Stralen does not suggest the claimed features as alleged in the Office Action.

The Office Action also states (with respect to previous dependent claim 5) that FIGs. 1 and 2 of the present application (AAPA) disclose the interleaving operation, the secondarily decoding and the deinterleaving operation are implemented simultaneously. See paragraph [12] describing the MAP decoding operation, the interleaving operation and the deinterleaving operation are sequentially performed. Thus, AAPA does not suggest the claimed features as alleged in the Office Action.

The Examiner contends however that Van Stralen does disclose the steps of implementing secondarily decoding, interleaving, and deinterleaving simultaneously.

Figure 1, displays an apparatus showing data flowing in a method such that primary decoding signals received (Top Parity Code Data, Systematic Data, Bottom Code Parity Data) are interleaved in Item 18, deinterleaved in Item 22, and secondarily decoded by either decoder 12 or decoder 14.

While it may be true that any processing through a MAP algorithm in Van Stralen on any particular set of data is performed sequentially, these operations are nonetheless implemented simultaneously, though the particular signal that is being “worked on” by each step may differ.

For Example, suppose there exists an assembly line to create a car. Let this assembly line comprise steps wherein:

- 1) The engine is created and connected.
- 2) The inner seats are attached.
- 3) The cosmetic implements are attached.

While it may be true that each car conforms to a sequential process for its creation, all of these steps are nevertheless in simultaneous operation. Even though no particular step is operated on for the same car to be, the fact remains that all of these steps are implemented simultaneously to achieve the overall desired operation to assemble a set of cars.

Similarly, the operation of the both Applicant's invention and the Van Stralen occurs on a stream of data, such as that provided by a line of transmission. Turbo decoding is a method used for advanced mobile communications as a form of error correction and like an assembly line, is continuously processing a feed of data with all parts "implemented simultaneously".

The Examiner further notes that Van Stralen discloses a simultaneous implementation for yet another reason.

Van Stralen (Figure 1) notably discloses three disparate lines of data input. The systematic data which feeds into interleaver 18 and Top Code memory 16 is interleaved, while the Bottom Code Parity Data input line feeds into the Map Decoder 14 and De-interleaver 22. While this is

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happening, data from a third disparate line, the Top Code Parity Data, feeds into Top Code Memory 16, and from there Map Decoder 12. More explicitly, each of the input lines is a disparate and independent entity, and the operations performed on each of them would necessarily require processing from three independent data lines to be “implemented simultaneously”

For these reasons, the Examiner has maintained the rejection under 35 U.S.C. 102(e) as being anticipated by Van Stralen et al.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Stralen et al., US patent 6304996.

In reference to claim 1:

Van Stralen et al. (Figure 1) discloses a method for performing turbo decoding, comprising:

- Primarily decoding signals received from a transmission system and storing the primarily decoded signals in a specific area of a memory, where the primary decoding signals are the signals of the top code parity data, the systematic data, and the bottom code parity data, and where the decoded signal is stored in the probability estimate memory.
- Interleaving the primarily decoded signals stored in the memory to change their order and secondarily decoding the interleaved signals, where the top and bottom signals are interleaved (Column 3, line 64- Column 4, line 4) et seq. and then run through the map decoder. (Figure 1, Item 14)
- Deinterleaving the secondarily decoded signals and storing the deinterleaved signals in the specific address space. (Figure 1, Items 22, 24)

In reference to claim 2:

Van Stralen et al. discloses the method of claim 1, wherein the primary decoding and the secondary decoding are iterated n times using a Maximum A posteriori (MAP) algorithm, where the decoder is a MAP decoder. (Figure 1, Items 12, 14) & (Column 1, lines 45-50)

In reference to claim 3:

Van Stralen et al. discloses the method of claim 2, wherein the primary decoding is performed using a current transmission system signal of the transmission system signals and an $(n-1)^{th}$ iteration signal of the secondarily decoded signals, where both the alpha and beta functions (understood in the art to as the forward and backward state probability functions) are

recursively defined (Column 3, lines 10-45) , making their computations (n-1)ⁿ iteration signals of the secondarily decoded values.

In reference to claim 4:

Van Stralen et al. discloses the method of claim 1, wherein the secondary decoding is performed using the transmission system signals and the primarily decoded signals, where the secondary decoding is the Map decoder (Figure 1, Item 14) and is performed using the original top code and bottom code signals.

In reference to claim 5:

Van Stralen et al. discloses the method of claim 1, wherein the interleaving operation, the secondarily decoding , and the deinterleaving operation are implemented simulataneously, where all the operations are implemented at the same time. (Figure 1)

In reference to claim 6:

Van Stralen et al. discloses a method for performing turbo decoding, comprising:

- Primarily decoding signals received from a transmission system and storing the primarily decoded signals into a specific address space of a memory. (Figure 1, Item 24)
- Interleaving the primarily decoded signals stored in the memory by an equation $E_i(k) = E(a(k))$, wherein $k = 1, 2, \dots, s$, s is a code block size, and $E(k)$ is a MAP decoded signal, and $a(k)$ is a general interleaving function necessarily defined by an interleaver of a turbo decoder. (Figure 1, "interleavers") (Column 3, lines 64- Column 4, line 4) et seq.

- Secondly decoding the interleaved signals in turn; (Figure 1, Item 14)
- Deinterleaving the secondarily decoded signals by an equation $E_d(a(k)) = E(k)$ wherein $k = 1, 2, \dots, s$, s is the code block size and the $E(k)$ is the MAP decoded signal; (Figure 1, Item 22) & (Column 3, lines 64- Column 4, line 4) et seq.
- Storing the deinterleaved signals in a predetermined region of the memory indicated by $a(k)$. (Figure 1, Item 24) & (Column 3, lines 64- Column 4, line 4) et seq.

In reference to claim 11:

Van Stralen et al. discloses a method for performing turbo decoding, comprising:

- Primarily decoding composite signals comprising systematic symbols $x_{k,(n-1)^{th}}$ iteration extrinsic information, and parity symbols y_k ; (Column 3, lines 10-45)
- Storing the primarily decoded composite signals in a specific address space of a memory; (Figure 1, Item 24)
- Interleaving the signals stored in the memory and secondarily decoding a second composite of the parity symbols y_k and the interleaved signals to generate n^{th} iteration extrinsic information. (Figure 1, "interleavers") (Column 3, lines 64- Column 4, line 4) et seq. & (Column 3, lines 10-45)
- Deinterleaving the secondarily decoded signals and storing the deinterleaved signals in the specific address space. (Figure 1, Items 22, 24)

Claims 7-10 are rejected for the same reasons as claims 2-4, respectively.

Claims 12-15 are rejected for the same reasons as claims 2-4, respectively.

Conclusion

6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of the final action and the advisory action is not mailed under after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension pursuant to 37 CFR 1.136(A) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication from the examiner should be directed to Thomas M Ho whose telephone number is (571)272-3835. The examiner can normally be reached on M-F from 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory A. Morse can be reached on (571)272-3838.

The Examiner may also be reached through email through Thomas.Ho6@uspto.gov

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-2100.

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TMH

January 7th, 2006


EMMANUEL L. MOISE
SUPERVISORY PATENT EXAMINER